Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
Central Regional Office • 627 Main Street, Worcester MA 01608 • 508-792-7650

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December 2, 2011

Mark Collette
Anna Maria College
50 Sunset Lane
Paxton, MA 01612

RE: **Paxton**
Transmittal No.: X240208
Approval No.: CE-11-025
Class: NM25
FMF No.: 132561
SSEIS No. 118-0797
NMCPA PLAN APPROVAL

Dear Mr. Collette:

The Central Regional Office of the Massachusetts Department of Environmental Protection, Bureau of Waste Prevention Permitting Section ("MassDEP"), has reviewed your Non-Major Comprehensive Plan Approval (NMCPA) Application (the "Application") listed above. This Application concerns the proposed installation and operation of a new wood fired boiler at Anna Maria College located at 50 Sunset Lane in Paxton, Massachusetts (the "Facility"). The submitted Application bears the seal and signature of Kenneth Kaliski, Massachusetts P.E. No. 49420.

This Application was submitted in accordance with 310 CMR 7.02: Plan Approval and Emission Limitations as contained in 310 CMR 7.00: Air Pollution Control Regulations promulgated by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Sections 142 A-N, and Chapter 21C, Sections 4 and 6.

This Plan Approval is limited to the applicable air pollution control regulations and does not constitute approval as may be required by other MassDEP regulations or statutes in order for the above-mentioned wood fired boiler to be installed and operated. This Plan Approval provides information on the project description, emission limitations, restrictions, specific conditions, record keeping, reporting and testing requirements.

MassDEP has determined that the Application, plans, specifications, and Standard Operating and Maintenance Procedures for the proposed equipment are in conformance with current air pollution control engineering practice, and with 310 CMR 7.00: Air Pollution Control Regulations, and hereby grants a **Plan Approval** for said Application, as submitted, subject to

the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner / operator ("Permittee") must comply in order for the Facility to be operated in compliance with this Plan Approval.

AIR QUALITY PLAN APPROVAL TR #X240208 -
Anna Maria College
Paxton, MASSACHUSETTS

I. HISTORY

MassDEP has not issued any plan approvals pursuant to 310 CMR 7.02 to the Permittee prior to this Plan Approval No. CE-11-025. Existing fuel burning equipment includes the following:

- Two Spencer boilers rated at 9,500,000 BTU per hour burning #2 fuel oil, installed in 1967,
- Several small boilers rated at less than 1,000,000 BTU per hour, and
- One Onan emergency generator rated at 175 kW.

The new wood fired boiler and the existing boilers are subject to 40 CFR 63 Subpart JJJJJJ, National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers Area Sources. At this date MassDEP has not accepted delegation of this rule, and the Permittee is advised to contact the United States Environmental Protection Agency for information about complying with this rule.

II. PROJECT DESCRIPTION

The project consists of installing a new wood fired boiler to supply heat and hot water to the Permittee's college buildings. The new boiler is a Biomax Model No. BM1650 unit rated at 7.0 million BTU per hour and designed to burn manufactured wood pellets. The new Biomax boiler is meant to substitute for the two existing Spencer boilers and is anticipated to displace the burning of approximately 100,000 gallons per year of #2 fuel oil in these boilers. The Spencer boilers will remain in place and will be used as backup boilers during downtime of the Biomax boiler.

Wood pellet fuel will be delivered to and stored in an outdoor storage silo. The pellets will be conveyed from the silo to a day bin and then to the boiler, by means of conveyors. The pellets will burn inside an underfed grate in the combustion chamber of the boiler. Ash will be handled in a closed/sealed system. Transverse augers will extract the ash from the combustion chamber to the external ash augers that auger into an ash container. Dust collected inside the multi cyclone will be augered together with the ash to the ash container.

The Biomax boiler utilizes staged combustion, automated combustion controls, a high combustion chamber temperature (typically 2,000 to 2,200 degrees F.), and periodic tune-ups to minimize emissions. An oxygen sensor, as well as temperature sensors in the combustion chamber, flue gas, and hot water output, will be used to monitor system performance. In addition, the burning of manufactured wood pellets instead of wood chips will allow for better combustion conditions because the pellets have lower moisture content and flow more easily than wood chips.

The Permittee has represented that the boiler is capable of meeting the limit of 0.1 pounds particulate matter per million BTU of heat input with a multicyclone for control of large particles, without the use of an additional fabric filter collector (baghouse). MassDEP has determined that the use of wood pellets for fuel and a high degree of combustion monitoring and control combined with a multicyclone for particulate emission control represent Best Available Control Technology (BACT) for this Application.

The Application presents a Good Engineering Practice (GEP) analysis for the height of the new boiler stack, showing that the stack meets GEP.

The Application presents the results of air dispersion modeling using AERMOD Version 11103. The following pollutants were modeled: CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$. MassDEP supplied design background concentration data which was from Worcester, Massachusetts. The modeling results indicate that the emissions from the Biomax boiler will not cause any exceedances of the National Ambient Air Quality Standards (NAAQS) for any of the pollutants modeled for short term and annual averaging periods.

III. EMISSION UNIT IDENTIFICATION

The emission units contained in Table 1 below are subject to and regulated by this Plan Approval:

Table 1

Emission Unit (EU#)	Description of Emission Unit	EU Design Capacity	Pollution Control Device (PCD)
1	Biomax Model No. BM 1650 Wood Pellet fired heating system	0.44 tons per hour, 7,000,000 British Thermal Units (BTU) per hour	Multicyclone

IV. EMISSIONS

Emission Unit (EU) #1 will emit products of combustion from burning wood pellets. These products of combustion include the criteria pollutants Particulate Matter (PM), Sulfur Dioxide (SO_2), Nitrogen Oxides (NOx), Carbon Monoxide (CO) and Volatile Organic Compounds (VOC).

V. EMISSION LIMITS AND RESTRICTIONS

The Permittee shall comply at all times with the emission limits and restrictions presented in Table 2 below.

Table 2

EU #	Fuel	Pollutant	Emissions Limit/Standard	Restrictions	Applicable Regulation and/or (Plan Approval No.)
1	Wood Pellets	PM	0.1 lb/MMBTU (Notes 1 and 2) and 1.2 TPY (Note 3)	Fuel usage not to exceed 1,500 tons per year (12-month rolling total) or 350 tons per calendar month.	All emission limits: 310 CMR 7.02(8)(a)2 (BACT)
		NOx	0.22 lb/MMBTU and 2.7 TPY		
		CO	0.18 lb/MMBTU and 2.2 TPY		
		SO_2	0.025 lb/MMBTU and 0.3 TPY		
		VOC	0.017 lb/MMBTU and 0.2 TPY		
		Visible Emissions (smoke and opacity)	Not to exceed 10% opacity at any time except during periods of cold start when the opacity may not exceed 20% for a period or aggregate period of time in excess of two minutes during any one hour provided that at no time during the said two minutes shall the opacity exceed 40%		

Table 2 Notes:

Note 1: lb/MMBTU = pounds per million British Thermal Units.

Note 2: PM includes total particulate, both filterable and condensable.
Note 3: TPY = tons per 12-month rolling total. The tons emitted shall be calculated on the basis of 8,100 BTU per pound of fuel, unless documentation is presented for an alternative heating value for the fuel.

VI. SPECIAL CONDITIONS

A. The Permittee shall only burn manufactured wood pellets in EU #1. The fuel shall be manufactured to the standards of the Pellet Fuel Institute (PFI) Standard Specification for Residential/Commercial Densified Fuel, or other recognized and acceptable industry standard. The fuel shall also conform to the definition of wood fuel in 310 CMR 7.00, in that it may not include materials which are chemically treated with any preservative, paint, or oil.

B. The Permittee shall ensure that wood pellet fuel deliveries are accomplished in a manner that minimizes dust emissions to the ambient air.

C. The Permittee shall develop and implement a plan to properly monitor and handle ash generated by the combustion of the wood pellets. The Permittee shall take appropriate action to minimize the release to the ambient air of particulate matter emissions from the handling of the ash. Ash that may be spilled on the ground shall be promptly removed in a manner that does not cause a condition of air pollution. Ash shall be used or disposed of in a manner that is consistent with the requirements of all applicable statutes and regulations.

D. The exhaust from EU #1 shall be vented to the ambient air through a new stainless steel 18 inch diameter vertical stack with an exit height of 45 feet above ground level and 21 feet 5 inches above roof level.

E. EU #1 shall be stack tested within 180 days of continuous operation to demonstrate compliance with the emission limits set forth in Table 2. The following pollutants shall be tested: Particulate Matter, and Visible Emissions (smoke and opacity). The Permittee shall ensure that any compliance tests that may be required at this facility shall be conducted in accordance with procedures set forth by the appropriate USEPA Reference Test Methods and Massachusetts Air Pollution Control Regulation 310 CMR 7.13 and in accordance with the below described requirements (VII.D.). A written pretest protocol shall be submitted to this Office for MassDEP approval at least 30 days prior to the actual test. A test results report shall be submitted to this Office within 45 days after the completion of any required compliance testing.

F. If the stack test referenced in VI.E. demonstrates that EU #1 does not meet the emission limits for PM and/or visible emissions set forth above in Table 2, then at the direction of MassDEP, the Permittee shall submit a NMCPA for the installation of appropriate additional air pollution control or process modification to control PM and opacity emissions.

G. The Permittee shall maintain on site at all times a copy of the operating and maintenance procedures for EU #1.

H. In accordance with 310 CMR 7.04(4)(a), EU #1 shall be inspected and maintained in accordance with the manufacturer's recommendations and tested for efficient operation at least once in each calendar year. The results of said inspection, maintenance and testing and the date upon which it was performed shall be recorded and posted conspicuously on or near EU #1.

VII. MONITORING & TESTING REQUIREMENTS

A. Monitoring equipment or emission monitoring systems installed for the purpose of documenting compliance with this Plan Approval shall be installed, calibrated, maintained and operated by the Permittee in sufficient manner to ensure continuous and accurate operations at all times.

B. Monitoring Devices – The Permittee shall maintain the following monitoring devices in an accurately and continuously operating condition: Combustion chamber temperature and oxygen monitors; combustion chamber draft sensor.

C. As described in the Application, the Permittee shall perform the following periodic monitoring:
- Once per day, do a visual plume inspection to determine the opacity (qualitative EPA Method 9), and
- Once per quarter, use a portable analyzer to monitor combustion conditions, and measure O_2, CO_2, CO, and the temperature in the combustion chamber outlet.

D. GENERAL TESTING REQUIREMENT- In accordance with 310 CMR 7.13, MassDEP may require testing for any pollutants to ascertain the mass emission rates and relationship to equipment design and operation. The Permittee shall conduct stack testing when MassDEP has determined that such stack testing is necessary to ascertain compliance with MassDEP's regulations or design approval provisions. Such stack testing shall be:

1. conducted by a person knowledgeable in stack testing,

2. conducted in accordance with procedures contained in a test protocol which has been approved by MassDEP, and

3. in the presence of a representative of MassDEP when such is deemed necessary in accordance with 310 CMR 7.13.

4. Emission testing to demonstrate compliance with the emission limits specified in Table 2 shall be in accordance with USEPA approved reference test methods unless otherwise approved by USEPA and MassDEP or unless otherwise specified.

E. The Permittee shall monitor the operations of the entire facility such that necessary information is available for the preparation of the Source Registration/Emission Statement forms as required by 310 CMR 7.12.

VIII. RECORD KEEPING REQUIREMENTS

A. A record-keeping system for EU #1 shall be established and continued on site by the Permittee. All records shall be maintained up-to-date such that twelve-month rolling period information is readily available for MassDEP examination. The Permittee shall maintain the following records on site for a period of five (5) years. Record keeping shall, at a minimum, include:

1. Compliance records sufficient to demonstrate that emissions have not exceeded what is allowed by this approval. Such records include but are not limited to fuel usage rates, fuel purchase receipts, emissions test results, monitoring equipment records and reports.

2. Maintenance: A record of routine maintenance activities performed on EU #1, control equipment and monitoring equipment including, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed.

3. Malfunctions: A record of all malfunctions of EU #1, control equipment and monitoring equipment including, at a minimum: the date and time the malfunction occurred; a description of the malfunction and the corrective action taken; the date and time corrective actions were initiated; and the date and time corrective actions were completed and the emission unit returned to compliance.

B. Records of emissions testing conducted to demonstrate compliance with the applicable requirements in Table 2 shall be maintained in accordance with 310 CMR 7.13.

C. The Permittee shall maintain sufficient records of its operations and monitoring information for the preparation of a Source Registration/Emission Statement Form as required by 310 CMR 7.12.

D. The Permittee shall keep on-site copies of the Source Registration/Emission Statement Forms submitted to MassDEP for five (5) years as required per 310 CMR 7.12.

E. PLAN APPROVAL LETTER - Pursuant to the authority granted to MassDEP at 310 CMR 7.02, the Facility shall maintain a copy of this Plan Approval, and any subsequent modifications of this Plan Approval, on-site for as long as the Plan Approval is valid. In

accordance with 310 CMR 7.02, the Plan Approval is valid until one of the following conditions occur: EU #1 is dismantled or removed from the facility, the facility notifies MassDEP that the Plan Approval is no longer valid, EU #1 is substantially reconstructed or altered and subject to 310 CMR 7.02, the Plan Approval is superseded by another approval, or MassDEP revokes the Plan Approval in accordance with 310 CMR 7.02.

F. OPERATING AND MAINTENANCE PROCEDURES - The facility shall maintain a copy of the approved Standard Operating Procedure (SOP) and Standard Maintenance Procedure (SMP) for all air-pollution-control-related equipment on-site for as long as this Plan Approval is valid. Updates or revisions to the SOP and SMP shall be submitted for MassDEP approval prior to initiating the modification(s).

IX. REPORTING REQUIREMENTS

A. The Permittee shall notify the MassDEP (Permit Chief, BWP, MassDEP, 627 Main Street, Worcester, MA 01608) as soon as reasonably practical by telephone, email, or fax after the occurrence of any upsets or malfunctions (i.e., any piece of equipment or device breakdown that causes an emission in excess of any limit set forth in Table 2) and in writing within two (2) business days of such event.

B. The Permittee shall summarize and submit to MassDEP (Permit Chief, BWP, MassDEP, 627 Main Street, Worcester, MA 01608) the results of stack testing as prescribed in MassDEP's approved pretest protocol, stack testing that was determined by MassDEP to be necessary to ascertain compliance with MassDEP's regulations or design approval provisions in accordance with 310 CMR 7.13.

C. Upon MassDEP's request, any records required by the applicable requirements identified in this Plan Approval, or pertaining to the emissions of any air contaminant from the facility, shall be submitted to MassDEP within 30 days of the request by MassDEP, or within a longer time period if approved in writing by MassDEP. Said response shall be transmitted on paper, on computer disk, or electronically at the discretion of MassDEP.

D. All required reports must be certified by a responsible official of the Permittee as provided in 310 CMR 7.01.

E. The Permittee shall complete and submit a Source Registration/Emission Statement Form to MassDEP on an annual or tri-annual basis as required by 310 CMR 7.12.

X. GENERAL CONDITIONS

A. This facility shall be installed and operated in a manner consistent with the plans and specifications as submitted under Tr. # X240208. Should there be any differences between the data submitted in Plan Application Tr. # X240208 and this approval letter, this approval

shall govern.

B. OPERATION - No person shall operate EU #1 except in conformance with the requirements established in this Plan Approval.

C. SUSPENSION, MODIFICATION, AMENDMENT OR REVOCATION - This Plan Approval may be suspended, modified, amended or revoked by MassDEP if, at any time, MassDEP determines that the Permittee is violating any condition or part of this Plan Approval. This Plan Approval may be modified or amended when in the opinion of MassDEP a modification or amendment is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions. Any relaxation of an emission limit or a specific condition noted in this Plan Approval that would result in an increase in emission rates as established in this Plan Approval must be made according to the standards and procedures set forth in 310 CMR 7.02.

D. OTHER REGULATIONS - This Plan Approval does not negate the responsibility of the owner/operator to comply with any other applicable federal, state, or local regulations now or in the future. Nor does this Plan Approval imply compliance with any other applicable federal, state or local regulation now or in the future.

E. Pursuant to 310 CMR 7.01, 7.02, 7.06, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).

F. ASBESTOS – Should asbestos remediation/removal be required as a result of this Plan Approval, such asbestos remediation/removal shall be done in accordance with Regulation 310 CMR 7.15.

G. REMOVAL OF AIR POLLUTION CONTROL EQUIPMENT - Notwithstanding 310 CMR 7.02., no person shall cause, suffer, allow, or permit the removal or alteration of, or shall otherwise render inoperative, any air pollution control equipment or equipment used to monitor emissions which has been installed as a requirement of 310 CMR 7.00, other than for reasonable maintenance periods or unexpected and unavoidable failure of the equipment, provided that MassDEP has been notified of such failure, or in accordance with specific written approval of MassDEP.

H. COMPLIANCE ASSURANCE FEE – Pursuant to 310 CMR 4.03, an annual fee, based on the Commonwealth's fiscal year, will be charged to your facility to cover the cost of compliance activities performed by MassDEP, including registrations, report reviews, inspections, source registration reviews, etc. No fee shall be charged in the fiscal year that the permit is issued. If multiple air quality permits exist for a facility, the facility shall pay the single highest applicable fee. This fee does not include stack test fees.

I. The Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

XI. LIST OF PERTINENT INFORMATION

- Non-Major Comprehensive Plan Approval Application, dated September 2011

XII. MASSACHUSETTS ENVIRONMENTAL POLICY ACT

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00, Section 11.04, provide certain "Fail-Safe Provisions," which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

XIII. APPEAL

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to Commonwealth of Massachusetts in the amount of one hundred dollars ($100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

The request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority. MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking

a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Should you have any questions concerning this Plan Approval, please contact Paul Dwiggins by telephone at (508)767-2760, or in writing at the letterhead address.

Sincerely,

Roseanna E. Stanley
Section Chief
Bureau of Waste Prevention

RES/PD

ecc: Dana Samuelson, CERO
Yi Tian, Boston/BWP